

LEAN 101

PULL

PULL SYSTEM: To produce or process an item (unit of work) only when the customer needs it and has requested it: Use One; Make One. The customer can be internal or external. An essential part of any Build- or Provide-To-Order strategy. Having set up the framework for Flow, the next step is to only produce/provide what the customer needs. Pull means that no one upstream should produce goods or services until the customer downstream asks for it. This is in contrast to a Push System.

Pull is one of the 3 Elements of Just-In-Time. The pull system enables the production of what is needed, based on a signal of what has just been "sold." The downstream process/customer takes the product/service they need and 'pulls' it from the producer. This 'customer pull' is a signal to the producer that the service/product has been used/consumed by the customer. The pull system links accurate information with the process to minimize overproduction.

Lean 101 - PULL

Lean = What the customer wants, when the customer wants it.

Why use *pull* systems and *one-piece flow*?

A ***pull*** system controls the flow of work through an organization by only releasing materials/items/services into the process as the customer demands them, i.e. only when they are needed. A ***push*** system, on the other hand, releases/schedules material/items/services into the process as projected customer orders are processed and material becomes available – Push is generally anticipatory and often based on projected need (Just-In-Case).

On the other hand, appropriate use of a *Pull* system is seen as key towards achieving true Just-In-Time (JIT) service provision. It is one of the three elements of Just-In-Time, along with Takt Time and Continuous Flow (using Kanban).

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The pull system enables the production of what is needed, based on a signal of what has just been “sold” or provided/consumed. The downstream process takes the product they need and ‘pulls’ it from the producer. This ‘customer pull’ is a signal to the producer that the service is provided/product is sold. The pull system links accurate information with the process to minimize overproduction.

The benefits of pull systems and small batches or one-piece flow can be easily seen and felt in a best practice operation/process (or even experienced in a simulation exercise), where the concept is powerful and simple: “Make only what the customer (or next step) wants, when the customer (next step) wants it.”

The results are:

- Shorter lead times (the time it takes for customers to get what they requested).
- Lower inventory carrying costs.
- Shorter time to detect errors and quality problems.
- Lower risk of obsolescence.
- Less handling damage and lower material handling costs.
- Lower space requirements and shorter travel distances.

Why would you ever choose to do anything else?

Why not?

Two examples that are quickly understood -- and very often used -- are that of inventory waste and doing work in batches to save time. There are at least two very old beliefs at work here: First, that *Inventory Protects* & second, that *Large Batches Reduce Changeover Time*.

Inventory Protects: Many people believe that having inventory is like having insurance. They keep it to protect themselves against things that can go wrong.

- Equipment breaks down, and it saves time to have spares on hand.
- A percentage of work has errors/defects, so having that extra "cushion" assures that you will have enough good work.
- Suppliers are unreliable.
- Bottleneck steps/equipment so that you can't get what you need
- Run out of supplies/stock.
- Forecast of actual need is unreliable and this will help you to provide the extra services/work than you had not planned on.

We keep inventory so that even if these things go wrong, we can keep the process going. Even if we implement a one-piece or small batch, pull system but don't solve existing problems – the process will stop. And predictably, of course, at this point it will be extremely tempting to back slide and go back to the old way of doing things.

Large Batches Reduce Changeover Time: As we all know, the general belief is that running large batches of work results in fewer changeovers. For example, if it takes one hour to change from one product/service to another and half an hour to run the customer's order, eight orders/requests could be combined to get a run time of 80%.

If we process small batches, say one order at a time (but maybe containing multiple items/documents/etc.), run time will be only 33%. However, workers might then complain about the extra changeover work, and managers would worry about downtime - and once again, the irresistible call of familiar former practices would be hard to fight.

New Perspectives

Although the Lean approach has been shown to result in substantial gains and benefits in a wide variety of businesses, it will not succeed in any organization without, what may seem at times, a counter-intuitive change in thinking. For example, the new perspectives could be *Inventory Hides Problems & Reduce Changeover Time by Reducing Changeover Time*.

Inventory Hides Problems: If we increase inventory to protect us against problems, we have only hidden the problems. And those problems are the real waste that adds cost and lengthens response time. They should be solved, not hidden by unneeded inventory.

Reduce Changeover Time by Reducing Changeover Time: We need to address changeover directly. We have taken changeover as immutable and a fact of life and haven't learned how to reduce it. It is time to examine changeover tasks and to reduce them.

Keep in mind that the decreased costs associated with a lower changeover time may hide the resulting higher costs associated with larger inventories, more complex scheduling (erratic "delivery"), and fewer frequent setups (less setup practice, less skill development and maintenance).